AMENDMENTS

In the Claims

1.**(currently amended)** A composition comprising a polymerizing agent including at least one molecular and/or atomic tag covalently bonded to a site on the polymerizing agent, where a fluorescence ~~detectable~~ property of the tag undergoes a change before, during and/or after each of a sequence of monomer incorporations and where the changes in the fluorescent property generate data evidencing each monomer incorporation producing a monomer incorporation read out.

2.**(currently amended)** The composition of claim 1, wherein the fluorescence ~~detectable~~ property has a first value when the polymerizing agent is in a first state and a second value when the ~~polymerase~~ polymerizing agent is in a second state, and where the polymerizing agent changes from the first state to the second state and back again during each monomer incorporation.

3.**(original)** The composition of claim 2, wherein the polymerizing agent is a polymerase or reverse transcriptase.

4.**(original)** The composition of claim 3, wherein the polymerase is selected from the group consisting of *Taq* DNA polymerase I, T7 DNA polymerase, Sequenase, and the Klenow fragment from *E. coli* DNA polymerase I.

5.**(original)** The composition of claim 3, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

6.**(currently amended)** The composition of claim 3, wherein the polymerase comprises *Taq* DNA polymerase I having a tag ~~attached at~~ covalently bonded to an amino acid site of the *Taq* polymerase selected from the group consisting of 513-518, 643, 647, 649 and 653-661 and ~~mixtures or combinations thereof of the *Taq* polymerase~~, where the tag comprises a fluorescent molecule.

7.**(currently amended)** A composition comprising a polymerase or reverse transcriptase including at least one molecular and/or atomic tag covalently bonded to a site on the polymerase or reverse transcriptase, where a d fluorescence ~~detectable~~ property of the tag has a first value when the polymerase or reverse transcriptase is in a first state and a second value when the polymerase

or reverse transcriptase is in a second state ~~during monomer incorporation~~, and where the ~~polymerizing agent~~ polymerase or reverse transcriptase changes from the first state to the second state and back again during each of a sequence of monomer incorporations and where the changes in the detectable property generate data evidencing each monomer incorporation producing a monomer incorporation read out.

8.(**original**) The composition of claim 7, wherein the polymerase is selected from the group consisting of *Taq* DNA polymerase I, T7 DNA polymerase, Sequenase, and the Klenow fragment from *E. coli* DNA polymerase I.

9.(**original**) The composition of claim 7, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

10.(**currently amended**) A composition comprising a polymerizing agent including a molecular and/or atomic tag covalently bonded to a site on the ~~polymerase~~ polymerizing agent and a monomer including a molecular and/or atomic tag, where at least one of the tags has a fluorescence ~~detectable~~ property that undergoes a change before, during and/or after each of a sequence of monomer incorporations due to an interaction between the polymerizing agent tag and the monomer tag and where the changes in the detectable property generate data evidencing each monomer incorporation producing a monomer sequence read out.

11.(**currently amended**) The composition of claim 10, wherein the change in the fluorescence ~~detectable~~ property results from a change in the conformation of the ~~polymerase~~ polymerizing agent from a first conformational state to a second conformational state and back again during each monomer incorporation.

12.(**currently amended**) The composition of claim 10, wherein the fluorescence ~~detectable~~ property has a first detection propensity when the ~~polymerase~~ polymerizing agent is in the first conformational state and a second detection propensity when the ~~polymerase~~ polymerizing agent is in the a second conformational state.

13.(**original**) The composition of claim 12, wherein the polymerizing agent is a polymerase or

reverse transcriptase.

14.(**original**) The composition of claim 13, wherein the polymerase is selected from the group consisting of *Taq* DNA polymerase I, T7 DNA polymerase, Sequenase, and the Klenow fragment from *E. coli* DNA polymerase I.

15.(**original**) The composition of claim 13, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

16.(**currently amended**) The composition of claim 12, wherein ~~the~~ each of the monomers comprises a deoxynucleotide triphosphate (dNTP) and the monomer tag is covalently bonded to the β or γ phosphate group of each dNTP.

17.(**currently amended**) The composition of claim 10, wherein the tags comprises ~~a~~ fluorescent tags and the fluorescence ~~detectable~~ property comprises an intensity and/or frequency of emitted fluorescent light.

18.(**currently amended**) The composition of claim ~~16~~ 17, wherein the fluorescent property is FRET where either the monomer tag or the polymerase tag comprises a donor and the other tag comprises an acceptor and where FRET occurs when the two tags are in close proximity ~~the detectable property is substantially active when the polymerase is in the first conformational state and substantially inactive when the polymerase is in the second conformational state or substantially inactive when the polymerase is in the first conformational state and substantially active when the polymerase is in the second conformational state~~.

19.(**original**) The composition of claim 14, wherein the polymerase comprises *Taq* DNA polymerase I having a tag attached at a site selected from the group consisting of 513-518, 643, 647, 649 and 653-661 and mixtures or combinations thereof of the *Taq* polymerase, where the tag comprises a fluorescent molecule.

20.(**currently amended**) A composition comprising a polymerase or reverse transcriptase including a pair of tags covalently bonded to two different sites ~~a site~~ of the polymerase or reverse

transcriptase, where a fluorescence ~~detectable~~ property of at least one of the tags undergoes a change before, during and/or after each of a sequence of monomer incorporations and where the changes in the fluorescent property generate data evidencing each monomer incorporation producing a monomer sequence read out.

21.(**currently amended**) The composition of claim 20, wherein the fluorescence ~~detectable~~ property has a first value when the polymerase is in a first state and a second value when the polymerase is in a second state, and where the ~~polymerizing agent~~ polymerase or reverse transcriptase changes from the first state to the second state and back again during each monomer incorporation.

22.(**original**) The composition of claim 21, wherein the polymerase is selected from the group consisting of *Taq* DNA polymerase I, T7 DNA polymerase, Sequenase, and the Klenow fragment from *E. coli* DNA polymerase I.

23.(**original**) The composition of claim 21, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

24.(**currently amended**) The composition of claim 22, wherein the polymerase comprises *Taq* DNA polymerase I ~~having a~~ has at least one tag attached at an amino acid site of the Taq DNA polymerase I selected from the group consisting of 513-518, 643, 647, 649 and 653-661 ~~and mixtures or combinations thereof of the *Taq* polymerase~~, and where ~~the tag comprises a fluorescent molecule~~ one tag is a donor fluorescent tag and the other tag is an acceptor fluorescent tag.

25.(**withdrawn**)

26.(**withdrawn**)

27.(**withdrawn**)

28.(**withdrawn**)

29.(**withdrawn**)

30.(**withdrawn**)

31.(**withdrawn**)

32.(**withdrawn**)

33.(**withdrawn**)

34.(**withdrawn**)

35.(**new**) A composition comprising a polymerizing agent including a fluorescent donor molecular tag covalently bonded to a site on the polymerizing agent and a plurality of deoxynucleotide triphosphate (dNTP), each dNTP including a fluorescent acceptor molecular tag covalently bonded to a γ-phosphate of the dNTP, where the fluorescent donor tag and each acceptor tag of an incorporating dNTP interact in the presence of an excitation light generating a FRET response and where the FRET response produces a read out of each dNTP incorporation.

36.(**new**) The composition of claim 35, wherein each acceptor tag is different generating a different FRET response and producing a dNTP sequence read out.

37.(**new**) The composition of claim 35, wherein the polymerizing agent is a polymerase or reverse transcriptase.

38.(**new**) The composition of claim 35, wherein the polymerase is selected from the group consisting of *Taq* DNA polymerase I, T7 DNA polymerase, Sequenase, and the Klenow fragment from *E. coli* DNA polymerase I.

39.(**new**) The composition of claim 37, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

40.(**new**) The composition of claim 36, wherein the dNTPs comprise dATP, dTTP, dCTP and dGTP.

41.(**new**) The composition of claim 36, wherein the dNTPs comprise dATP, dUTP, dCTP and dGTP.

42.(**new**) The composition of claim 40, wherein the polymerase comprises *Taq* DNA polymerase I having a tag attached at a site selected from the group consisting of 513-518, 643, 647, 649 and 653-661 and mixtures or combinations thereof of the *Taq* polymerase, where the tag

comprises a fluorescent molecule.

43.(**new**) The composition of claim 6, wherein the amino acid site of the *Taq* DNA polymerase I represents a cysteine amino acid substitution and the tag is covalently bonded to the SH moiety of the cysteine amino acid substitution.

44.(**new**) The composition of claim 19, wherein the amino acid site of the *Taq* DNA polymerase I represents a cysteine amino acid substitution and the tag is covalently bonded to the SH moiety of the cysteine amino acid substitution.

45.(**new**) The composition of claim 24, wherein the amino acid site of the *Taq* DNA polymerase I represents a cysteine amino acid substitution and the tag is covalently bonded to the SH moiety of the cysteine amino acid substitution.

46.(**new**) The composition of claim 42, wherein the amino acid site of the *Taq* DNA polymerase I represents a cysteine amino acid substitution and the tag is covalently bonded to the SH moiety of the cysteine amino acid substitution.